LOUISIANA NATURAL AND SCENIC RIVERS SYSTEM

PERMIT APPLICATION

Permit # 902 (Assigned by Department)

The Louisiana Department of Wildlife and Fisheries' Scenic Rivers program is authorized by LRS title 56, Chapter 9 Part II. This law requires permits authorizing activities in or affecting rivers that have been designated by the Louisiana Legislature as Natural and Scenic. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary, however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

APPLICANT INFORMATION

Name of Applicant	Comstock Resources, Inc.	Name of Agent (if any)	EcoScience Resource Group, LLC
Address	5300 Town and Country Blvd.	Address	11827 Sunray Ave.
Address	Suite 500	Address	
City, State, Zip	Frisco, TX 75034	City, State, Zip	Baton Rouge, LA 70816
Phone	972.668.8800 (Keith Lorenz)	Phone	225.755.8844 (Pete Lee)

DESCRIPTION OF THE PROPOSED ACTIVITY

Brief summary of the description and purpose of the proposed activity (details to be attached as a separate document)

Withdraw water from the Tickfaw River into private pond storage for use in hydraulic fracturing.

Is any portion of the activity complete? YES (NO) (If yes indicate month and year of completion)

LOCATION OF PROPOSED ACTIVITY

Stream Name	Tickfaw River	Names, Addresses, Phone Numbers of Adjacent Property Owners
Parish	St. Helena	Frances Martin Robbins
Section	1S	10211 Magnolia Road
Township	5E	Denham Springs, LA 70726
Range	56	225.667.1956
Latitude/Longitude	N30° 58' 42.9", W90° 40' 30.8"	

ENVIRONMENTAL ASSESSMENT

Must be a separate document. See the attached instruction sheet for completing the assessment.

CONFIRMATION OF INFORMATION ACCURACY

Application is hereby made for a Scenic River Use Permit to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that, to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities, or I am acting as the duly authorized agent of the applicant.

Signature

6/3/14
Date

Form # LSR3 May 2002

EcoScience Resource Group, L.L.C.

Louisiana Scenic River Permit Application

for
Tickfaw River Intake 2
St. Helena Parish, Louisiana

Prepared for

Comstock Resources, Inc.
5300 Town and Country Blvd.
Suite 500
Frisco, TX 75034

COMSTOCK RESOURCES

June 2, 2014

11827 Sunray Avenue
Baton Rouge, Louisiana 70816
225.755.8844

State of Louisiana

BOBBY JINDAL
GOVERNOR

DEPARTMENT OF WILDLIFE AND FISHERIES

ROBERT J. BARHAM
SECRETARY

Dear Scenic River Permit Applicant:

Please review and concur on the following statement regarding the issuance of permits by the Louisiana Department of Wildlife and Fisheries. This agreement must be signed and returned before a Scenic River Permit can be issued.

"I have been advised and do understand that by applying for and accepting a Scenic Rivers permit issued by the Louisiana Department of Wildlife and Fisheries, I am being allowed to engage in an activity which would otherwise be prohibited by law or for which a permit is required. I understand that the permit is not a license and confers no property right upon me. I specifically agree to abide by all State and Federal fish and wildlife laws and regulations, and all State and Federal laws and regulations which relate to this permit or the permitted activity, and by all other terms and conditions of this permit. I understand that the permit for which I am applying may be suspended, annulled, withdrawn or revoked and that I may be assessed civil penalties, all in accordance with the provision of the Louisiana Administrative Procedure Act, and that I may be denied future permits as a consequence of my failure to fully and completely comply with the terms and conditions of the permit, as well as other laws and regulations pertinent thereto. If served with or notified of a cease and desist order signed by the Scenic Rivers Administrator, I agree to immediately and without delay cease all activities and operations which relate to the permitted activity or which are impacting the Scenic River, until such time as the matter can be resolved in an adjudicatory hearing pursuant to the Louisiana Administrative Procedure Act. I understand and agree that any permit issued to me by the Louisiana Department of Wildlife and Fisheries is in the nature of a privilege which is being voluntarily extended to me by the Department and the failure on my part to cooperate with the Department can result in the loss of the privilege conferred and the denial of future requests for permits. By accepting this permit, I evidence my agreement to be bound by all conditions and stipulations set forth herein."

Authorized Signature

6/3/14
Date

REV. 12/7/98

1.0 PROJECT DESCRIPTION

Comstock Resources, Inc. is planning to drill and develop a well in the Tuscaloosa Marine Shale (TMS) by hydraulic fracturing. The water supply will be provided by surface water from the Tickfaw River in St. Helena Parish on private property. The Tickfaw River has been designated as a Scenic River from the Mississippi-Louisiana state line to LA Hwy. 42.

The planned extraction point is designated as Intake 2 (Figure 1) and is located at N30° 58' 42.9", W90° 40' 30.8". All figures are in Appendix A. The water will be pumped into a man-made storage impoundment on private property, outside of the 100-foot Scenic River buffer, and then pumped to the well site. The surface water will be pumped from a screened intake hose by a trailer-mounted pump into a temporary discharge line to the storage pond and to the well site, which is within a mile of the intake point. The water supply required is 300,000 barrels (bbls) or 12,600,000 gallons. The pumping rate will vary from 25-80 bbls/minute or 1,050-3,360 gallons per minute (gpm). Based on these rates with constant pumping, withdrawal could be from 2.6 to 8.3 days. Pumping may be discontinuous and periodic in stages.

2.0 PROJECT LOCATION

The Intake 2 location is depicted on an aerial photograph (Figure 2) and topographic map (Figure 3) in Appendix A. Access to the intake point of withdrawal is through a cleared established private pasture and then through a previously cleared pathway through hardwood and pine forest to the river bank. No trees or flora will be affected by operations. Figures 4-7 are photographs of the Tickfaw River intake on May 20, 2014.

3.0 OTHER REQUIRED PERMITS

The Louisiana Department of Natural Resources (DNR) has a Louisiana Running Surface Water Use Cooperative Endeavor Agreement with a Surface Water Withdrawal Application. This application will be submitted.

4.0 ENVIRONMENTAL ASSESSMENT

4.1 Existing Land Use

The access property adjacent to the intake is privately-owned developed pasture and partially-cleared hardwood and pine forest on the river bank. The land is used for agriculture and recreation by the owner.

4.2 Historical/Archeological Sites

The National Register of Historic Places indicates that there are only two (2) sites in St. Helena Parish and both are in the town of Greensburg. A request for the presence of archaeological sites was sent to the State Historical Preservation Officer (SHPO).

4.3 Economic Impact of the Project

The drilling and production of the well will generate increases in tax revenue for the parish and state as severance taxes, ad valorem taxes and sales taxes. The well may generate drilling/production of more wells in the parish. The local population may benefit from the creation of jobs and services.

4.4 Wilderness/Rural Quality

The temporary extraction point is adjacent to private property. The Tickfaw River has hardwood forest along the banks except at the intake point, which is open. There are no jurisdictional wetlands affected by pumping or access. The landowner has sole access to the extraction point area. There will be no disturbance to the existing land. Land in this area is rural with agricultural and hunting uses. The nearest residence is approximately 2,800 feet to the east.

4.5 Scenic/Aesthetic Value

The use of the extraction point is temporary and the site will be restored to existing condition. There is no aesthetic value except to the landowner. Access from up or downstream is limited due to shallow seasonal depth and numerous natural barricades such as downed trees to restrict navigation (Figures 5 and 6).

4.6 Recreational Use/Opportunity

This portion of the Tickfaw River is designated as segment LA4050100 of the Lake Pontchartrain Basin in the LDEQ 2010 Louisiana Water Quality Inventory. Designated water body uses are primary contact recreation (swimming), secondary contact recreation (boating) and outstanding natural resource water (Appendix B). The only direct access for recreation is controlled by the landowner. Access from upstream or downstream for swimming or boating is unlikely. Temporary use of the extraction point will not interfere with the water body uses.

4.7 Ecological System Present

The existing flora on the river bank is hardwood forest and other associated plants. There is an open pathway to the intake point. All equipment and discharge hoses will use the pathway. There is limited habitat for wildlife and there are presently periodic visits to the area by the landowner. The river supports limited aquatic species due to the shallow depth. No wetlands are present. The bank is steeply incised at the intake point; the top of the bank is 12 feet above the stream bottom.

4.8 Fish and Wildlife in the Area

The listing of rare, threatened and endangered species from the DWF Natural Heritage Program indicates that no threatened or endangered species are found in St. Helena Parish. The Alabama Shad (Alosa alabamae) is listed as a federal candidate species. The rare plants and animals will not be affected since there will be no vegetative clearing and a filter will be attached to the pump intake to prevent taking of any aquatic species. As a precaution, the work area will be surveyed to identify and avoid any rare plant species prior to equipment placement.

4.9 Botanical Elements

The area adjacent to the intake is an opening in the hardwood/pine forest with natural grasses (Figure 6). No trees or vegetation will be cut or removed.

4.10 Geological Features

The surface geology of the intake point comprises Pleistocene high terrace deposits consisting of tan to orange clay, silt and sand with large amounts of basal gravel (Geologic Map

of Louisiana, 1984). The bank elevation at the intake point is approximately 239 feet, North American Vertical Datum (NAVD). The elevation increases to the northeast over 1,500 feet to approximately 290 feet, NAVD (Figure 3). To the west, the elevation increases slightly across the floodplain to approximately 245 feet, NAVD over a distance of approximately 3,000 feet.

4.11 Hydrological Features

The Tickfaw River is a tributary in the Lake Pontchartrain Basin. The basin is bounded on the north by the Mississippi state line, on the west and south by the east bank Mississippi River levee, on the east by the Pearl River Basin, and on the southeast by Breton and Chandeleur Sounds. This basin includes Lake Borgne, Breton Sound, Chandeleur Sound, and the Chandeleur Islands. The northern part of the basin consists of wooded uplands, both pine and hardwood forests. The southern portions of the basin consist of cypress-tupelo swamps and lowlands and brackish and saline marshes. Elevations in this basin range from minus five feet at New Orleans to over two hundred feet near the Mississippi border.

The Tickfaw River watershed is depicted on the map in Appendix B and extends downstream from Amite County Mississippi through St. Helena and Tangipahoa Parishes to Livingston Parish and Lake Maurepas.

The intake point on the east bank is the undercut or eroding bank, which is approximately 12 feet of depth to the river bottom (Figure 4). The west bank slope or depositional bank comprises sand deposits with an approximate 45° slope (Figure 7).

4.12 Water Quality/Quantity

Segment LA4050100 is listed on the 303 (d) list of impaired water bodies due to mercury in fish tissue and total suspended solids (Appendix B). The causes are atmospheric deposition of mercury and drainage/filling/loss of wetlands. Extraction will not contribute to the impairment since mercury is not used and there are no wetlands to be affected. Best management practices, such as silt fences and mats will be used to prevent sediment from entering the river if needed.

The projected volume needed for the well is 12,600,000 gallons at a rate of 1,050-3,360 gpm. The dimensions of the extraction point were measured on May 20, 2014 as follows:

Width (ft)	Water depth from bottom (ft)	Depth from bank to bottom (ft)	Water Volume/foot (ft^2)
40	4	12	160

The velocity was measured with a MFP51 Stream Flowmeter. In addition, velocity and discharge data over the past 12 months were obtained from the USGS Liverpool gauge graph approximately 3 miles downstream at Hwy. 38 (Appendix B). Average velocities over time at the Liverpool gauge were obtained from the USGS *Technical Report 70, Low-Flow Characteristics of Louisiana Streams* (Appendix B).

	Velocity (ft/sec)	Discharge (ft^3/sec)	Discharge (gpm)
Flow Meter	0.3	48	21,542
Liverpool Gauge May 20		51	22,888
Liverpool Gauge (12-month Min.)		40	17,952
Liverpool Gauge (12-month Max.)		9,000	4,039,200
TP 70 7Q10		78	35,606
TP 70 99%		77	34,557
Min. Pump Rate			1,050
Max. Pump Rate			3,360

The discharge at the intake is calculated by multiplying the water/volume/foot of 160 ft^2 by the velocity. The TP 70 7Q10 flow is the lowest annual average flow for 7 consecutive days over a 10-year interval. The TP 70 99% is the flow rate that exceeds 99% of days.

The lowest measured discharge on May 20, 2014 was 21,542 gpm. The flow rate at the Liverpool gauge on May 20, 2014 was 22,888` gpm (Appendix B). The ratio of the measured rate at the intake to the gauge is 94%. This ratio is then used to reduce the TP 70 99% rate to adjust it to the intake point, which results in 32,483 gpm. The minimum drawdown is based on the May 20, 2014 depth of 4 feet multiplied by the percentage of minimum and maximum drawdown.

Adjusted 99% (gpm)	Min. Flow Rate (gpm)	Max. Flow Rate (gpm	Min. % of 99% Discharge	Max. % of 99% Discharge	Min. Drawdown (ft)	Max. Drawdown (ft)
32,483	1,050	3,360	3.2	10.3	0.12	0.41

Therefore, the drawdown at the point of intake will be 0.12 to 0.41 feet, which will not prevent flow from continuing downstream. In addition, numerous tributaries downstream of the intake point recharge the Tickfaw River. Figure 8 depicts the intake and Liverpool Gauge locations in reference to the Tickfaw drainage area. Numerous tributaries recharge the Tickfaw upstream of the Liverpool Gauge including named tributaries Spring Creek and Mill Creek so pumping from the intake will only affect a portion of the stream flow.

5.0 LEGAL AGREEMENT

The signed legal agreement is in Appendix C.

6.0 COMPLIANCE HISTORY

The applicant has no regulatory or compliance history in Louisiana.

7.0 STEPS TO MINIMIZE IMPACTS

A site was chosen to minimize environmental impacts from vehicles and equipment. The intake is accessed by a developed pasture and there will be no impact to flora or fauna. There will be no impact to the Tickfaw River from sediment since there will be no earth clearing; however BMPs will be implemented if needed to prevent erosion and sediment into the river. The site was partially chosen because no wetlands will be affected. There are no federal or state endangered species in the project area. Aquatic species damage will be mitigated by the intake hose screen. The affected area will be surveyed for rare plant species and habitat and avoided if present.

The planned flow rates from the river are estimated to be 3.2-10.3% of the flow rate expected 99% of the time resulting in less than 0.5 feet of drawdown. The pumping will be from 2.8 to 8.3 days if pumped continuously. After removal of the equipment, the river access area and river will be restored to original condition prior to pumping.

8.0 PROJECT ALTERNATIVE

There are two sources of water in Louisiana: surface water and groundwater. Louisiana Water Resources Report dated Marc 15, 2012 encourages the use of abundant surface water over the use of high quality groundwater for hydraulic fracturing. Surface water from streams, ponds and lakes is the preferred alternative. For this project, water from the Tickfaw River will be pumped into storage ponds and then into the well. The Tickfaw River will naturally recharge over time from rainfall and springs. This section of the river, although it is a designated Scenic River, is relatively low quality, is impaired, is not used for recreation or fish and wildlife propagation and will not be affected except for temporary withdrawal. There will be no affect on recreation or wildlife. All water will be pumped and contained in hoses or ponds and water will not have to be transported via trucks, which increase traffic and safety hazards for the population, to the project area. Once the water is used, any flowback water will be contained, transported and disposed in an injection well.

9.0 SUMMARY

The proposed withdrawal of surface water from the Tickfaw River will NOT:

- Affect the current land use
- Impact historical sites
- Interfere with the use of the property or nearby residents
- Interfere with recreational use
- Affect the aesthetic value of the river
- Permanently alter the natural ecological system
- Impact wetlands
- Significantly impact fish and wildlife
- Require use of high quality ground water
- Cause the water quality to change
- Significantly reduce the stream flow
- Draw down the river to a level that prevents flow
- Add unnecessary truck traffic to the community

Figure 1. Regional Location Map

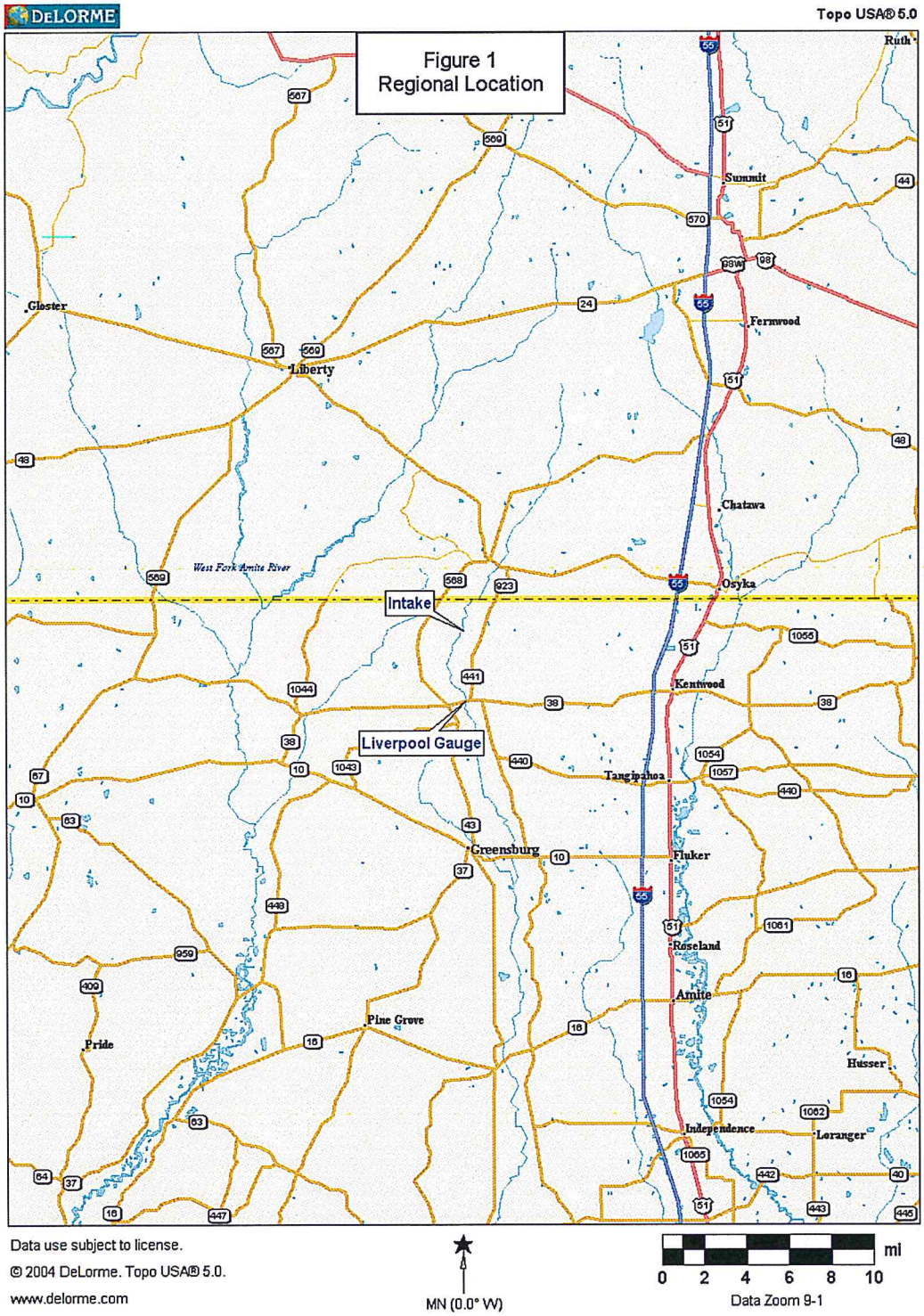


Figure 3. Topographic Map

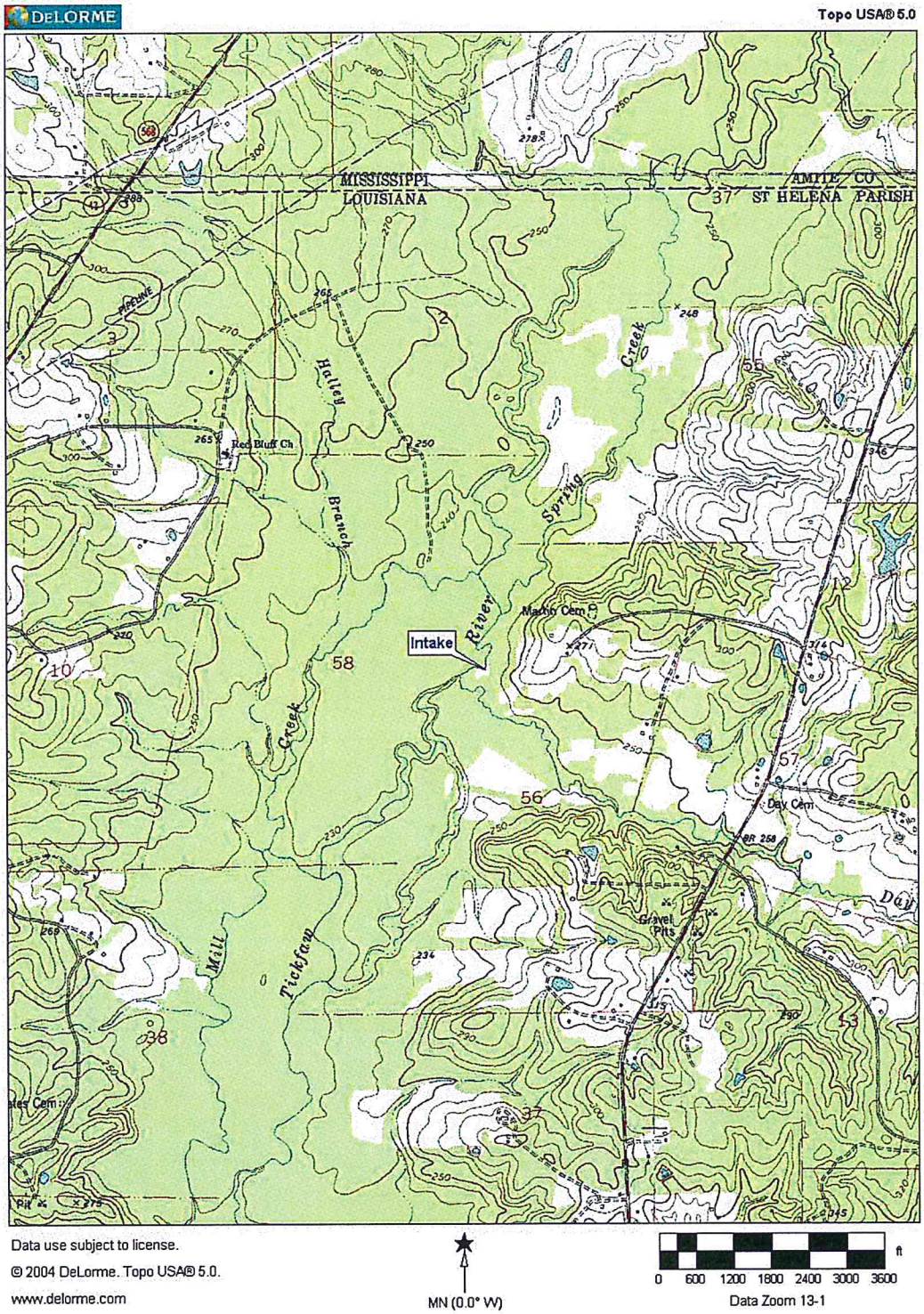


Figure 8. Tickfaw River Drainage Area

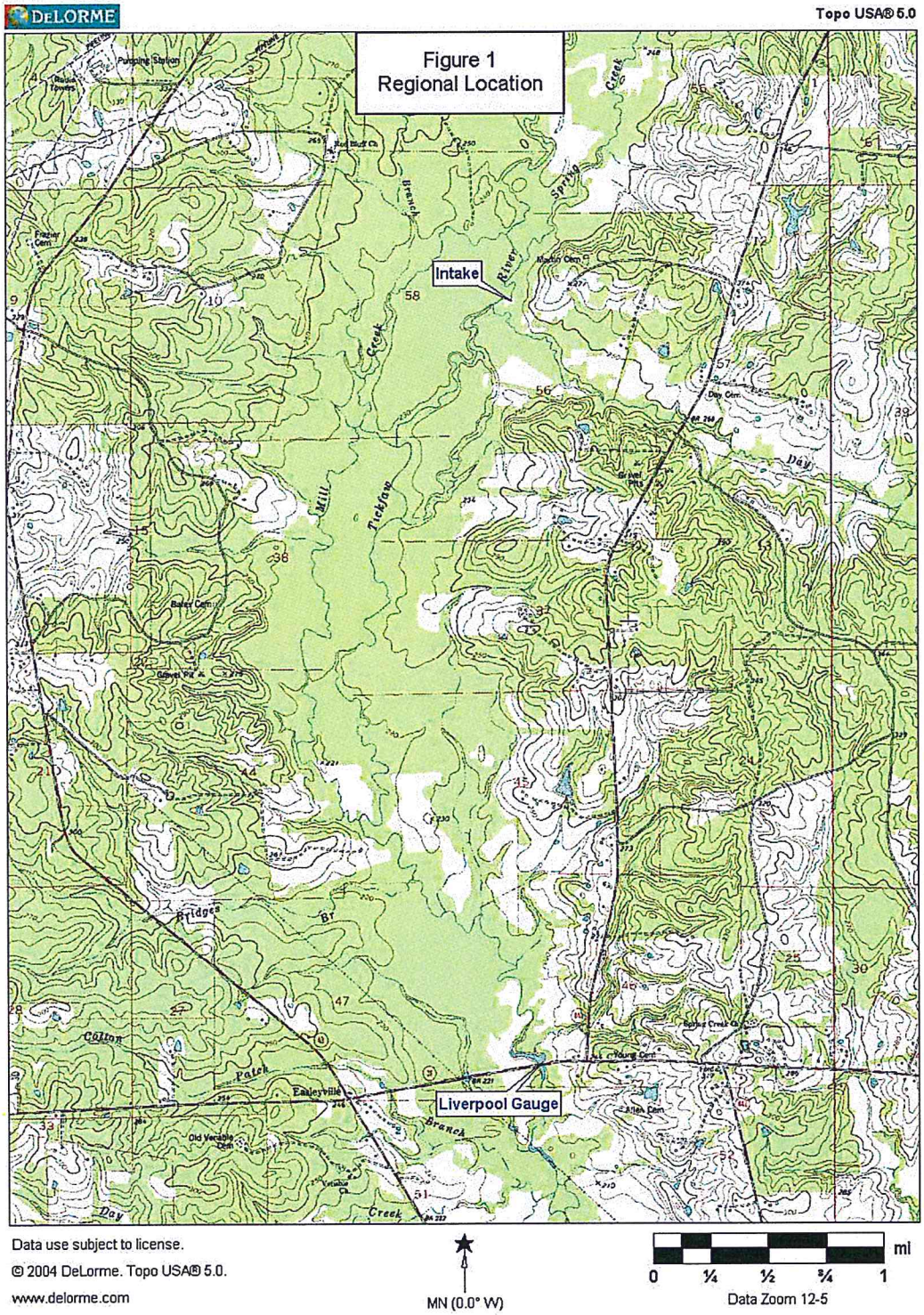
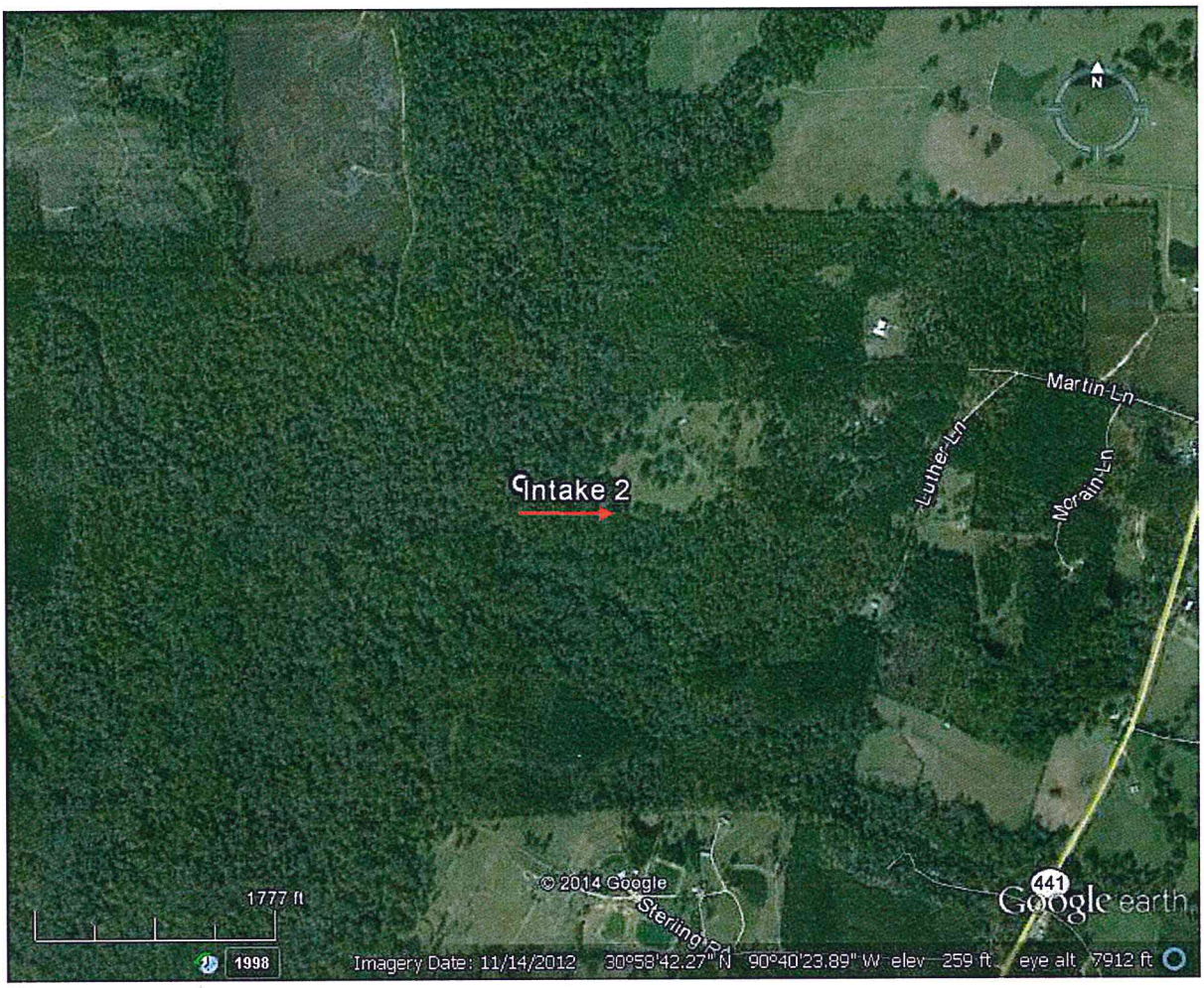


Figure 2. Aerial Photograph



= Discharge Direction

Figure 4. View of the Tickfaw River intake and west bank from the east bank.

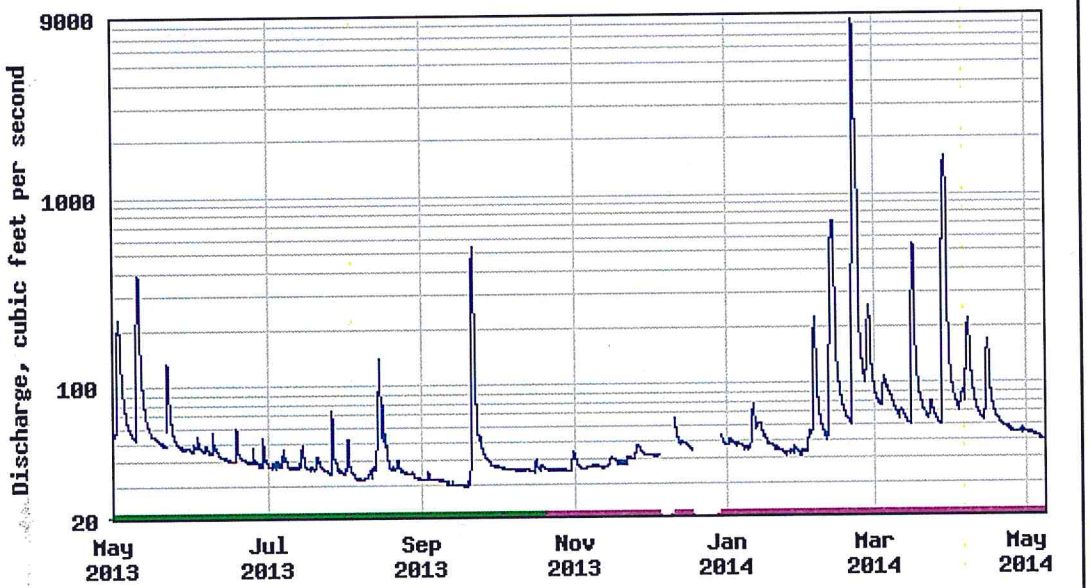
Figure 5. View upstream (north) from the intake.

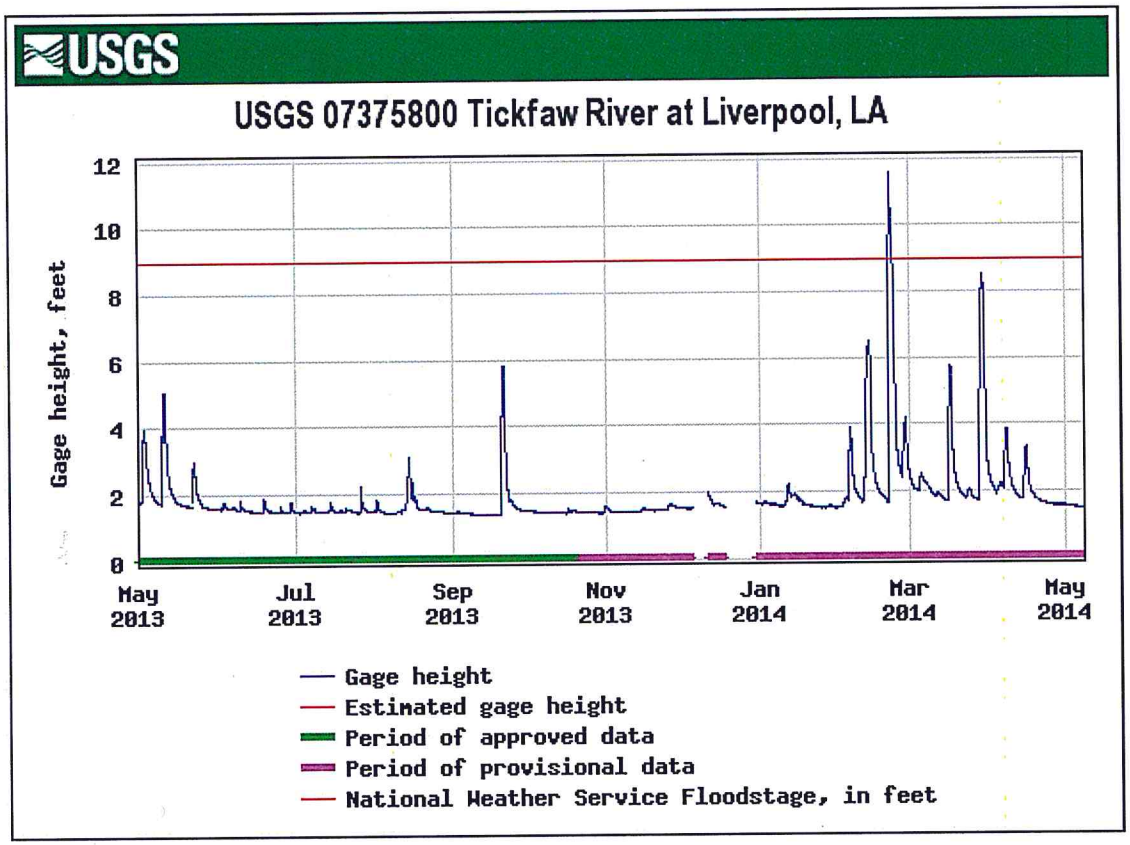
Figure 6. View downstream (south) from the intake.

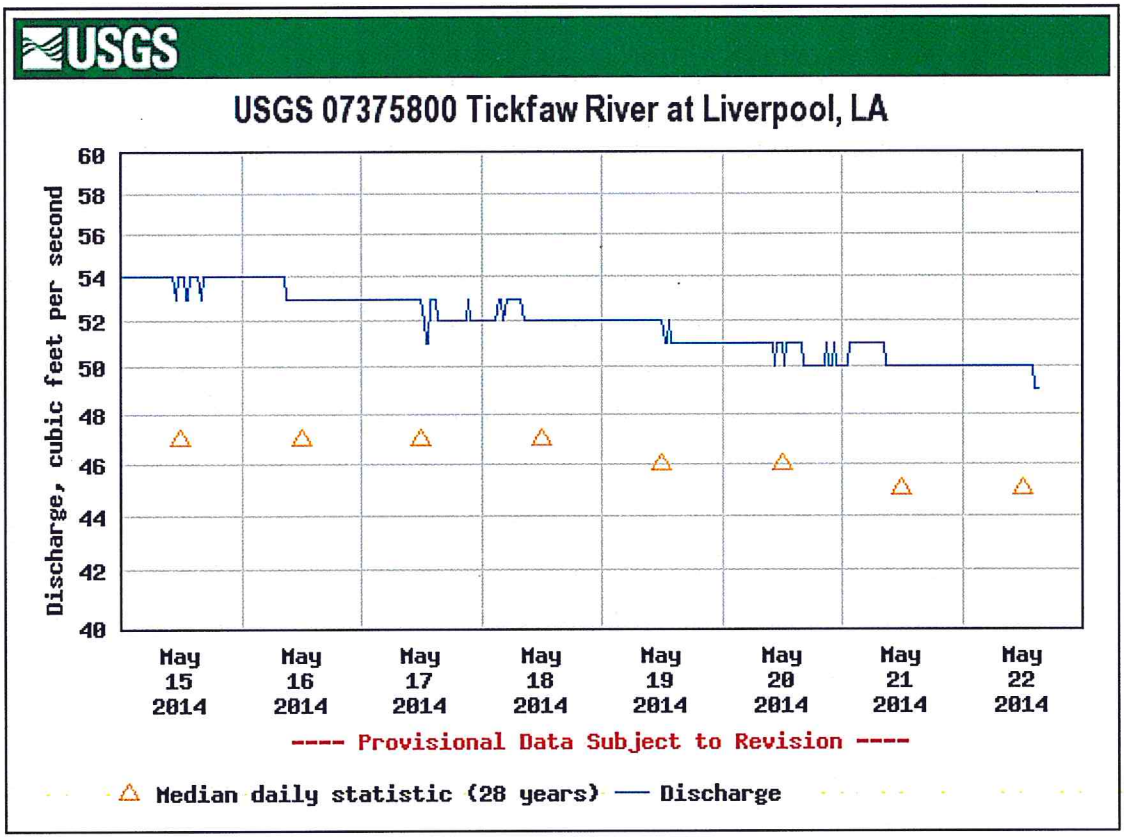
Figure 7. View of the west bank from the intake.

USGS

USGS 07375800 Tickfaw River at Liverpool, LA




USGS
USGS 07375800 Tickfaw River at Liverpool, LA
Gage height, feet
12
10
8
6
4
2
0
May 2013
Jul 2013
Sep 2013
Nov 2013
Jan 2014
Mar 2014
May 2014
Gage height
Estimated gage height
Period of approved data
Period of provisional data
National Weather Service Floodstage, in feet


USGS
USGS 07375800 Tickfaw River at Liverpool, LA
Discharge, cubic feet per second
60
58
56
54
52
50
48
46
44
42
40
May 15 2014
May 16 2014
May 17 2014
May 18 2014
May 19 2014
May 20 2014
May 21 2014
May 22 2014
---- Provisional Data Subject to Revision ----
Median daily statistic (28 years)
Discharge

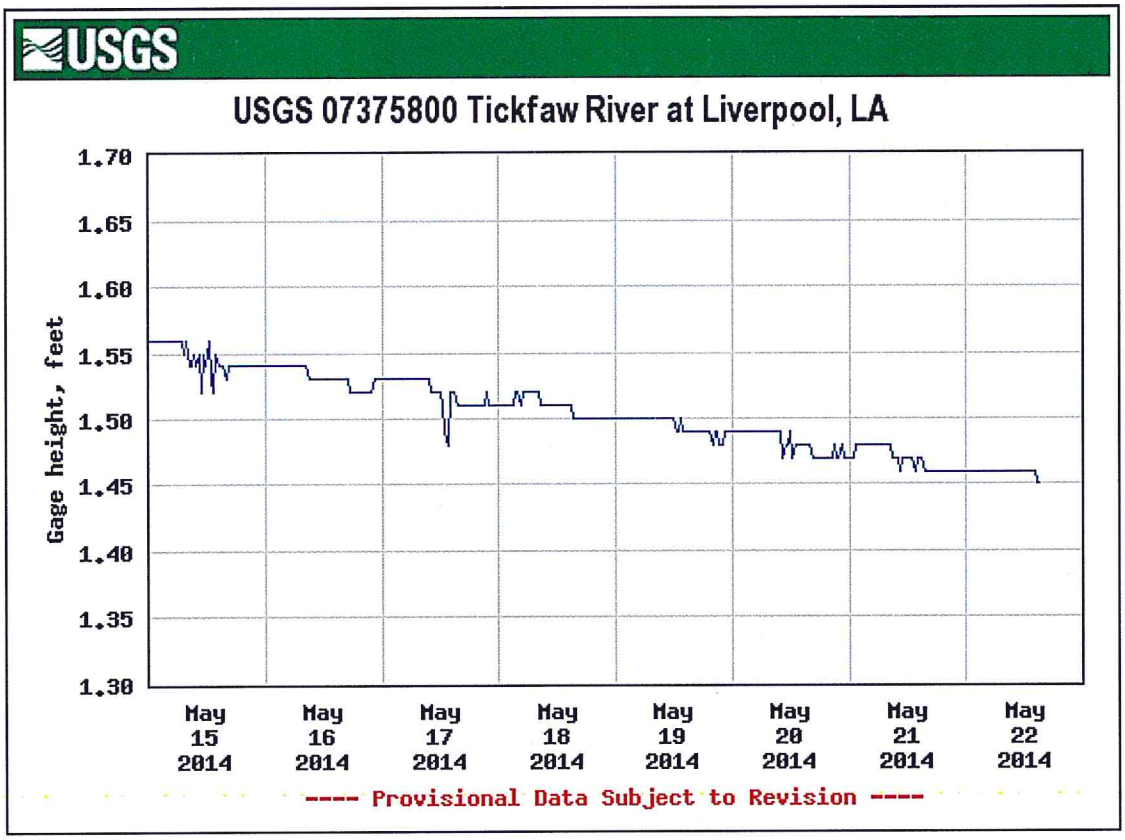

USGS
USGS 07375800 Tickfaw River at Liverpool, LA
Gage height, feet
1.70
1.65
1.60
1.55
1.50
1.45
1.40
1.35
1.30
May 15 2014
May 16 2014
May 17 2014
May 18 2014
May 19 2014
May 20 2014
May 21 2014
May 22 2014
---- Provisional Data Subject to Revision ----

Table 2. Low-flow characteristics for continuous-record streamflow-gaging stations having 10 or more years of record—Continued

07376000 Tickfaw River at Holden, La. (72)

LOCATION.--Lat 30°30′13″, long 90°40′38″, in SE1/4NE1/4 sec. 26, T. 6 S., R. 5 E., St. Helena Meridian, Livingston Parish, near left bank on downstream side of bridge on U.S. Highway 190, 0.5 mi west of Holden, and 5.1 mi upstream from Big Branch.

DRAINAGE AREA.--247 mi^2.

PERIOD OF RECORD.--October 1940 to September 1999.

MEAN-DAILY MINIMUM FLOW.--65 ft^3/s.

Lowest annual average flow, in ft^3/s, for the indicated number of consecutive days and recurrence interval

Days									
1	3	7	10	14	20	30	60	120	183
2-year recurrence interval									
95	95	97	98	99	100	103	111	130	159
5-year recurrence interval									
83	83	84	85	86	87	90	94	107	125
10-year recurrence interval									
77	77	78	79	80	81	83	88	98	112
20-year recurrence interval									
72	72	73	74	75	76	78	83	91	103

Lowest average flow, in ft^3/s, for the indicated season, number of consecutive days, and recurrence interval

March-May			June-August			September-November			December-February		
Days											
1	7	14	1	7	14	1	7	14	1	7	14
2-year recurrence interval											
128	134	142	105	109	114	96	98	100	123	135	150
10-year recurrence interval											
102	105	109	82	86	89	77	79	81	92	95	99
20-year recurrence interval											
96	99	104	76	80	83	72	75	77	86	86	91

Flow, in ft^3/s, which was exceeded for the indicated percentage of days

Percentage of days								
1	5	10	25	50	75	90	95	99
3,640	1,510	807	325	169	121	100	90	77